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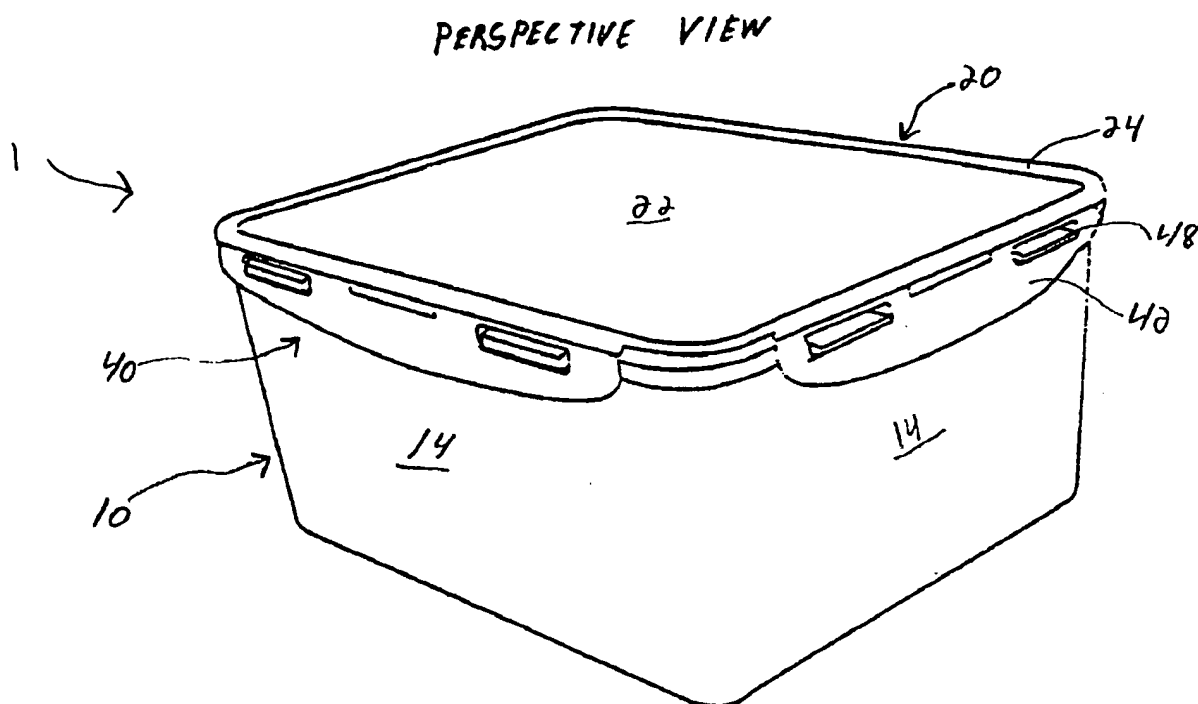
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(54) Titre : CONTENANT HERMETIQUE ET ETANCHE AUX LIQUIDES  
(54) Title: AIRTIGHT AND LIQUID TIGHT CONTAINER



(57) Abrégé/Abstract:

While several embodiments of the invention have been described, it will be understood that the present invention is capable of further modifications, and this application is intended to cover any variations, uses, or adaptations of the invention, following in general the principles of the invention and including such departures from the present disclosure as to come within knowledge or customary practice in the art to which the invention pertains, and as may be applied to the essential features hereinbefore set forth.

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## AIRTIGHT AND LIQUID TIGHT CONTAINER

### BACKGROUND OF THE INVENTION

5     a)     **Field of the invention**

The present invention relates to a container. More particularly, the invention relates to a container comprising a base and a lid, wherein the lid can be locked hermetically to the base. Such a container is particularly useful for storing food or any other similar perishable products.

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b)     **Brief description of the prior art**

Various food storage containers are known in the art. Such containers comprise a base and a lid that fits over the base. Typically, the base is made of a rigid or semi-rigid material whereas the lid is made of a flexible material that fits  
15 tightly and hermetically to the base. However, there are numerous problems with these known containers. First, the flexible lid is often deformed (dilatation) when subjected to high temperature, such as the temperature generally found in a dishwasher. This results in a loss of sealing when the lid is used later on. Furthermore, when the container is stored in cold conditions, in a freezer for  
20 instance, sealing between the lid and the base is reduced because of shrinking. Also, if the cover is knocked or dropped, leakage frequently occurs due to a removal of the lid from the base.

Accordingly, there is a need for a more airtight and liquid tight container  
25 which will remain sealed under various temperature and manipulation conditions.

The present invention fulfils these needs and also other needs which will be apparent to those skilled in the art upon reading the following specification.

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## DESCRIPTION OF THE INVENTION

As shown in Figures 1 to 4, the container 1 of the invention comprises:

- 5       - a base 10 having a bottom 12 and a plurality of side walls 14 defining altogether an open receptacle;
- a lid 20 shaped and sized for fitting over the base;
- sealing means 30 for providing an hermetical joint between the base 10 and the lid 20; and
- 10      - at least one locking means 40 for reversibly locking hermetically the lid to the base.

As best shown in Figs. 1 and 4, the lid 20 is devised to fit tightly onto the base 10. The lid comprises a central portion 22 and a peripheral portion 24. The peripheral portion 24 comprises an internal peripheral flange 26 and an external  
15      peripheral flange 28 which are spaced apart from each other and which extend perpendicularly underneath the lid 20.

The flanges 26,28 are devised to surround an upper peripheral portion 16 of the base 10. The flanges 26,28 and the upper peripheral portion 16 of the base 10  
20      are part of the sealing means 30. Furthermore, as shown in Fig. 4, the two flanges 26,28 and the central portion 22 of the lid 20 define a U-shaped channel 32. When the lid 20 and the base 10 are assembled together, the upper peripheral portion 16 of the base 10 is slid between the flanges 26,28 so that the internal flange 26 extends into the container 1 and the external flange 28 extends outside the  
25      container 1. Preferably, the flanges 26,28 and the upper peripheral portion 16 are shaped and sized to cooperate in a tight fit manner. Preferably also, the internal flange 26 is longer than the external flange for a better sealing.

The sealing means 30 further comprises a sealing ring 34 which seats into  
30      the channel 32. The sealing ring 34 improves greatly the sealing between the lid 20 and the base 10 when assembled together. The sealing ring 34 is preferably made of a flexible and water resistant material that can also resist to cold and hot

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temperatures. Preferably, the sealing ring 34 is made of silicone and more preferably of medical grade silicone.

For a better and safer assembly of the lid 20 to the base 10, the container 1  
5 further comprises at least one locking means 40, preferably one on each side of the container 1. As shown in Figs. 1 to 4, each locking means 40 comprises a flap 42 extending from the peripheral portion 24 of the lid 20 and a rib 48 extending outwardly from a side wall 12 of the base 10. The flap 42 is joined to the lid 20 with a universal foldable joint 44. In some circumstances, the joint 44 may comprise a  
10 slot for an easier folding of the flap 42. The flap 42 comprises at least one perforation 46 into which the rib 48 tightly fits. Accordingly, the base 10 and the lid 20 may be reversibly locked together by folding the flap 42 and inserting the rib 48 into it. For unlocking the lid 20, a user may simply lift the flap 42 for releasing it from the rib 48. Therefore, the flap is preferably shaped like an S (or a wave)  
15 toward the exterior for an easier handling.

In the illustrated preferred embodiment, the lid 20 is removable and not permanently connected to the base 10. However, a lid having a peripheral portion hinged permanently to the base is also conceivable according to the invention.  
20

The base 10 and the lid 20 are preferably transparent but they could also be made of an opaque and/or colored material. Preferably, the base 10 and the lid 20 are made of plastic, preferably polypropylene, and more preferably high density ultra-clear polypropylene. The latter is the most preferred since it can resist to  
25 extreme temperatures ranging from  $-30^{\circ}\text{C}$  to  $140^{\circ}\text{C}$ . The base 10 and the lid 20 are also preferably made by molding injection.

For uses such as the storage of food, it is also important that the container according to the invention be made of materials that fulfill hygiene and sanitation  
30 requirements. Accordingly, tests were carried out on a container according to the present invention comprising a base and a lid made of high density ultra-clear polypropylene and a sealing member made of medical grade silicone. Table 1

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hereafter confirms that such a container complies with the requirements of the Japanese Health and Welfare Decree No. 20, the highest standards in the industry.

5 **TABLE 1: Testings for the hygiene and sanitation in compliance with JHW**

A) Polypropylene resin used for the base and the Lid

PARAMETER		SPECIFIC REQUIREMENTS	RESULTS	RATING
MATERIAL ANALYSIS	Lead (Pb)	$\leq 100$ mg/kg	$\leq 10$ mg/kg	Pass
	Cadmium (Cd)	$\leq 100$ mg/kg	$\leq 5$ mg/kg	Pass
DISSOLVED MATTERS	Heavy metal (As Pb)	See note #1	Conforms	Pass
	Consumption of $\text{KmnO}_4$	$\leq 10$ mg/l	2 mg/l	Pass
	Residue on evaporation (with 4% acetic acid)	$\leq 10$ mg/l	4 mg/l	Pass

10 B) Silicone sealing member

PARAMETER		SPECIFIC REQUIREMENTS	RESULTS	RATING
MATERIAL ANALYSIS	Lead(Pb)	$\leq 100$ mg/kg	$\leq 10$ mg/kg	Pass
	Cadmium(Cd)	$\leq 100$ mg/kg	$\leq 5$ mg/kg	Pass
	2-Mercaptoimida-Zoline	Shall not detected	Not detected	Pass
DISSOLVED MATTERS	Heavy metal(As Pb)	See note # 1	Conforms	Pass
	Residue on evaporation (with 4% Acetic Acid)	$\leq 60$ mg/l	9mg/l	Pass
	Phenol	$\leq 5.0$ mg/l	Not detected	Pass
	Formaldehyde	$\leq 4.0$ mg/l	Not detected	Pass
	Zinc(Zn)	$\leq 15$ mg/l	$<0.1$ mg/l	Pass

Note 1: The color of the test solution shall not be deeper than that of standard solution (1mg/l)

While several embodiments of the invention have been described, it will be understood that the present invention is capable of further modifications, and this application is intended to cover any variations, uses, or adaptations of the invention, following in general the principles of the invention and including such  
5 departures from the present disclosure as to come within knowledge or customary practice in the art to which the invention pertains, and as may be applied to the essential features hereinbefore set forth.

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**CLAIMS:**

1. A container comprising:
    - 5       - a base having a bottom and a plurality of side walls defining an open receptacle;
    - a lid shaped and sized for fitting over the base;
    - sealing means for providing a hermetical joint between the base and the lid; and
    - 10      - at least one locking means for reversibly locking hermetically the lid to the base.
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FIG. 1 is a perspective view of a rectangular container 10. The container includes a bottom wall 12 and four side walls 14. A lid 20 is positioned on top of the container, featuring a top surface 22 and a rim 24. The lid 20 is secured to the side walls 14 by four latches 40, each having a handle 42. A dashed line 48 indicates the lid is hinged to the side wall 14.

Fig. 3: TOPVIEW OF THE BASE

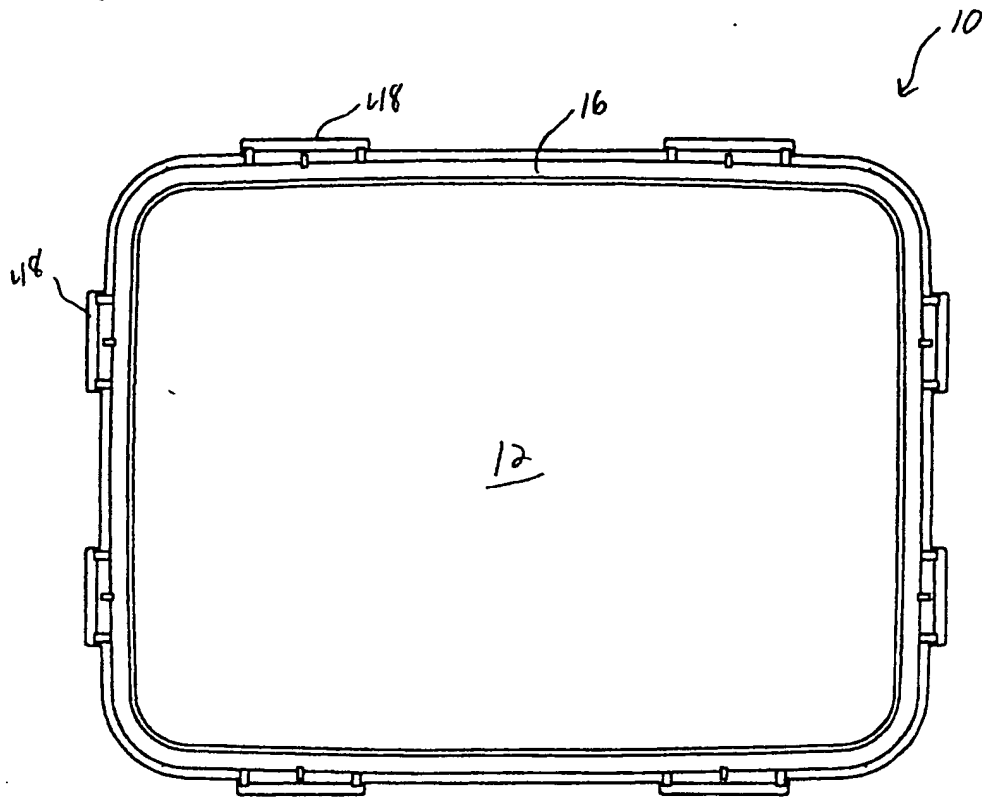
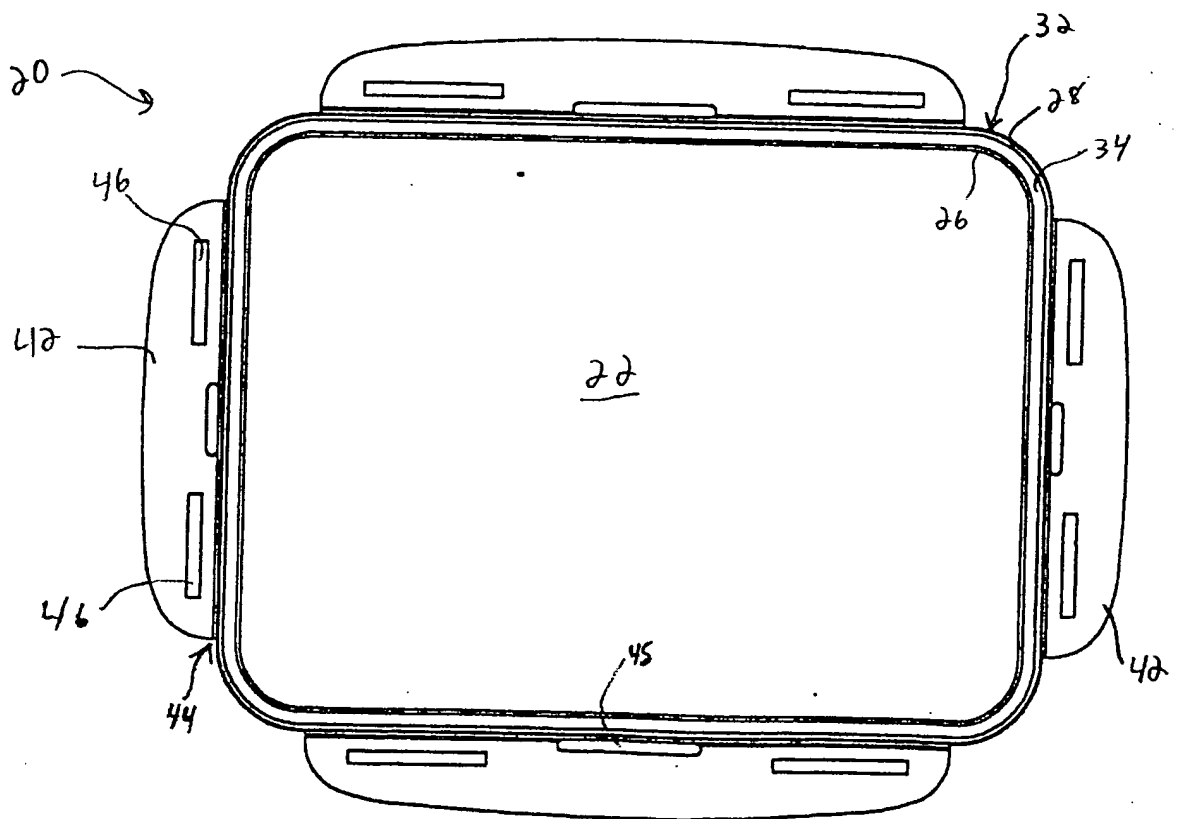


Fig. 4: BOTTOM VIEW OF THE LID



PERSPECTIVE VIEW

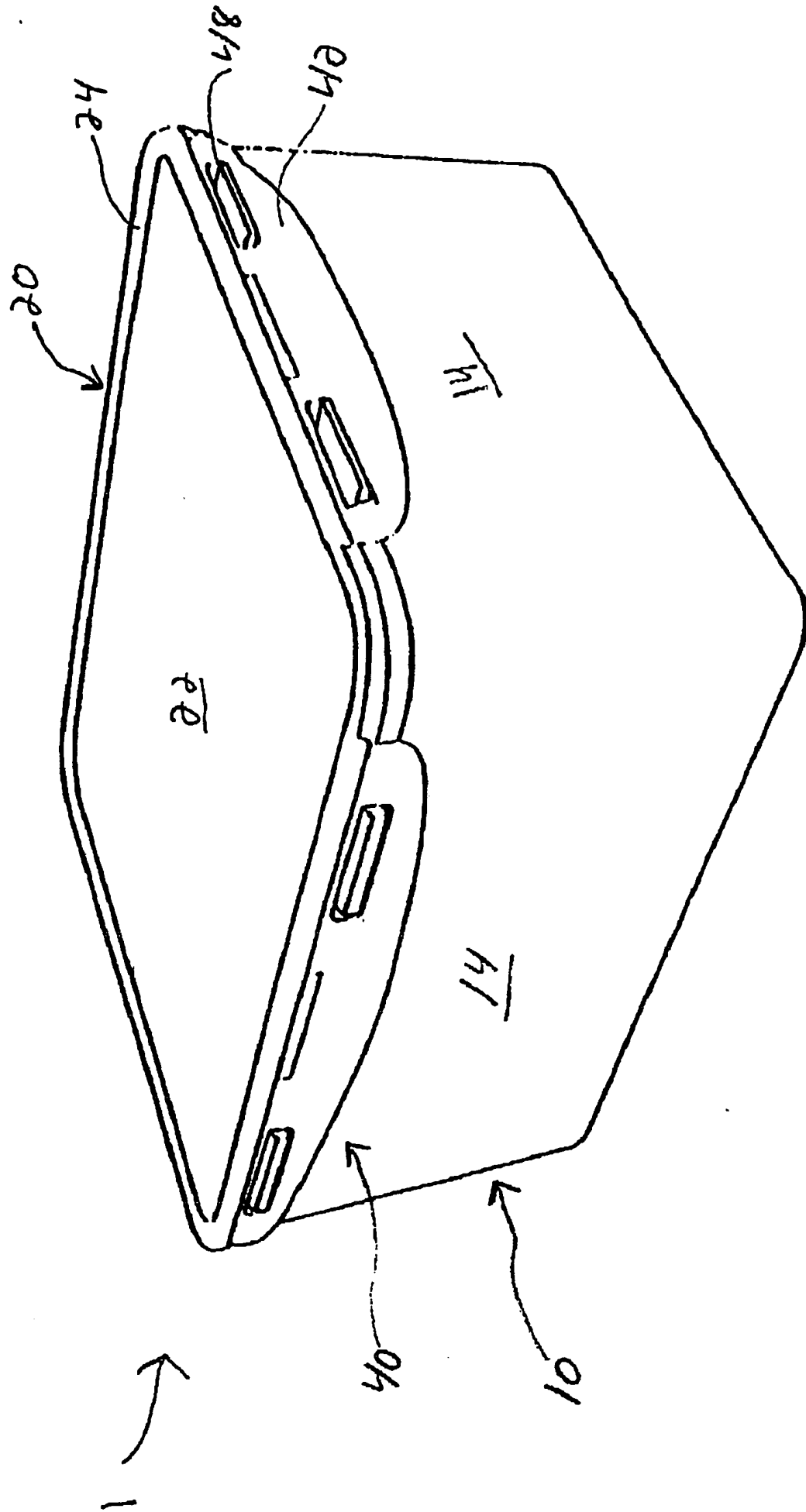


FIG. 1: PERSPECTIVE VIEW

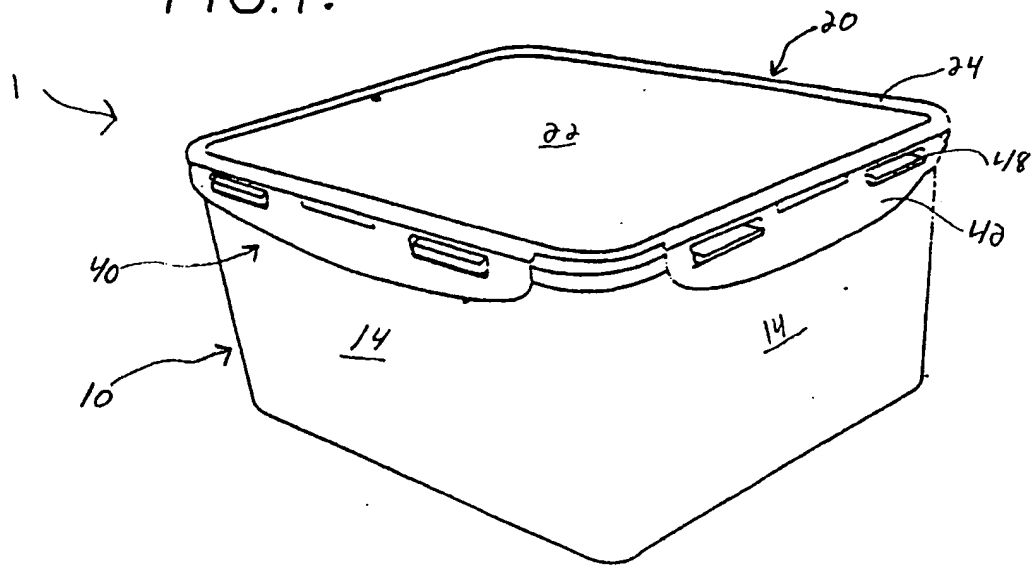


FIG. 2: SIDE VIEW

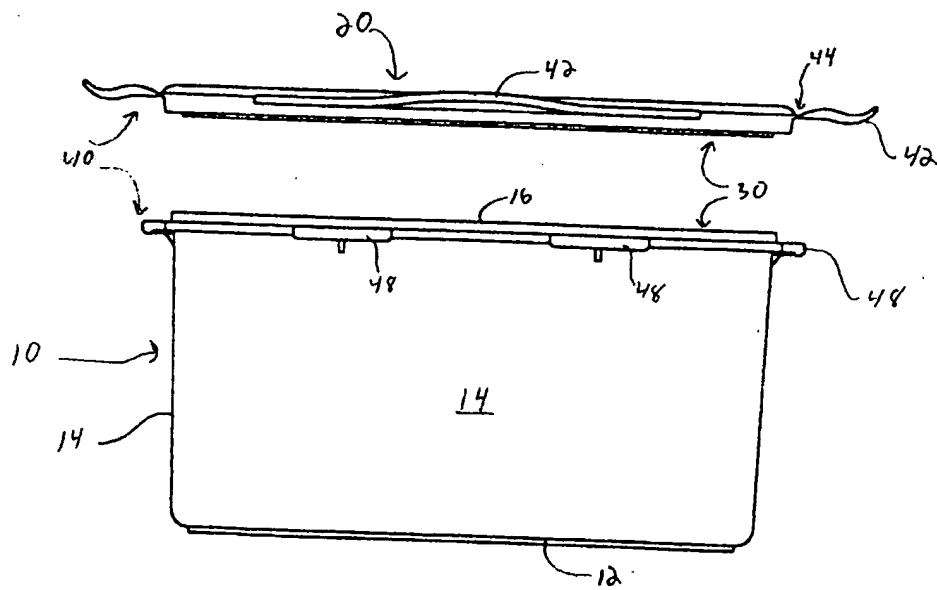


Fig. 3: TOP VIEW OF THE BASE

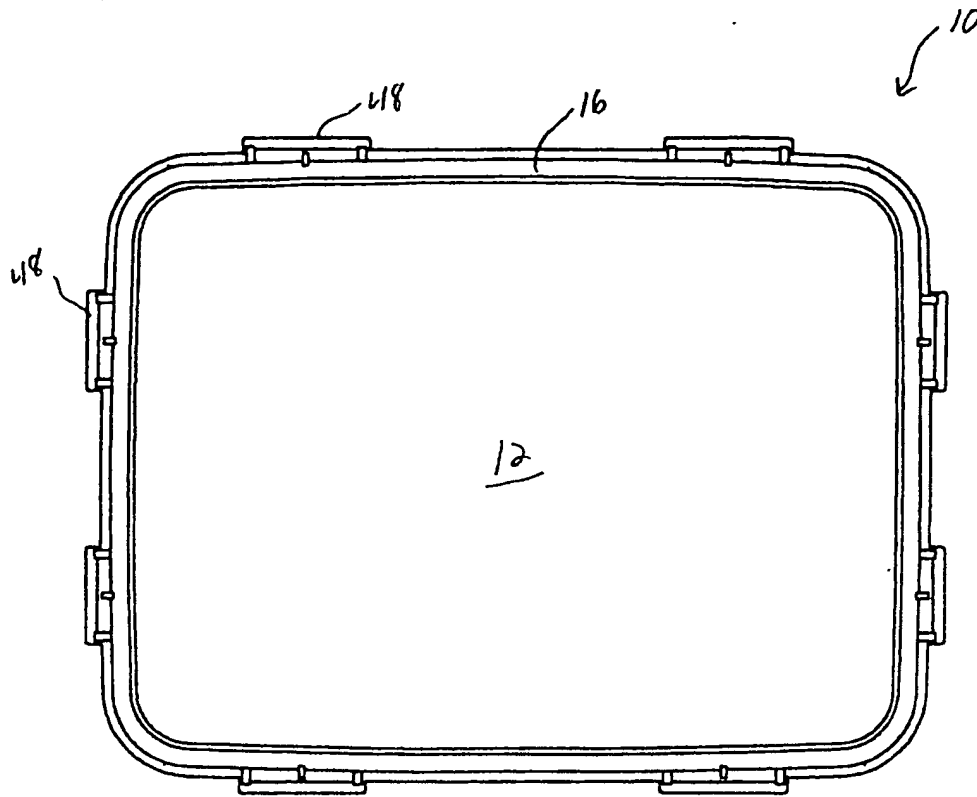
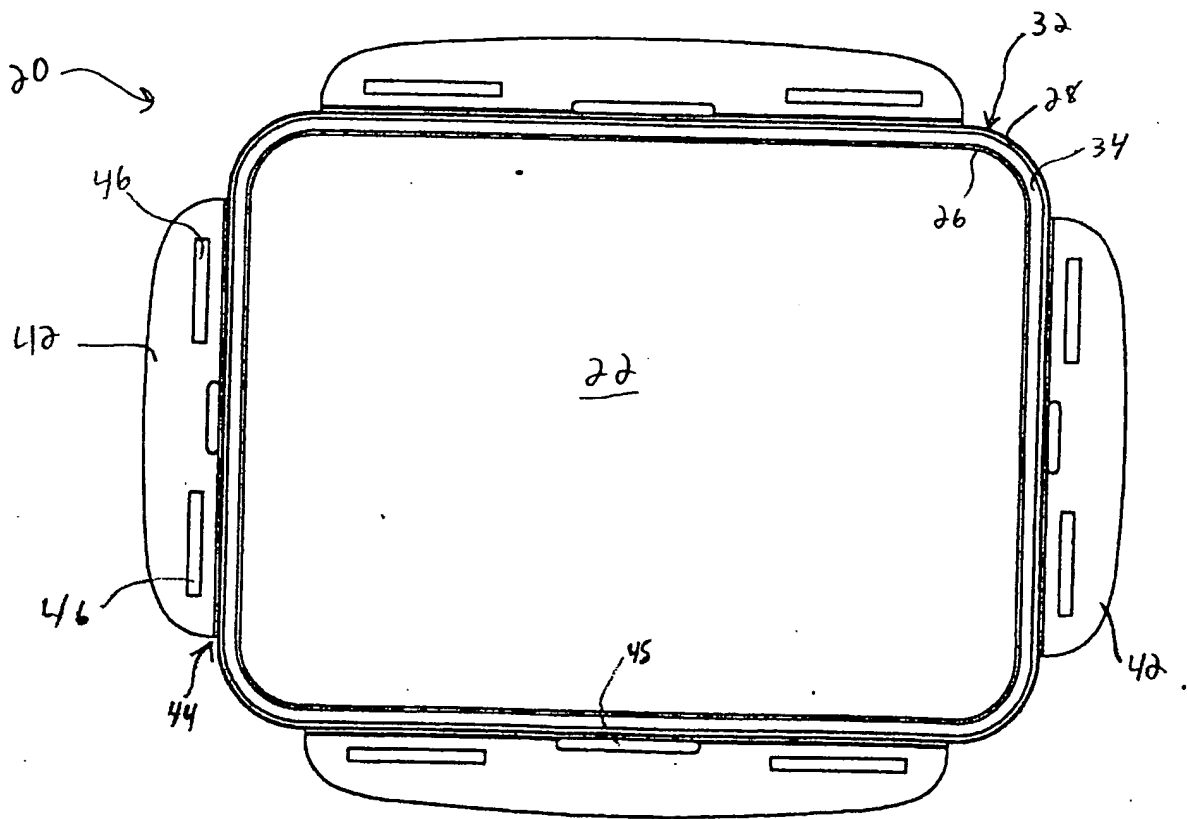
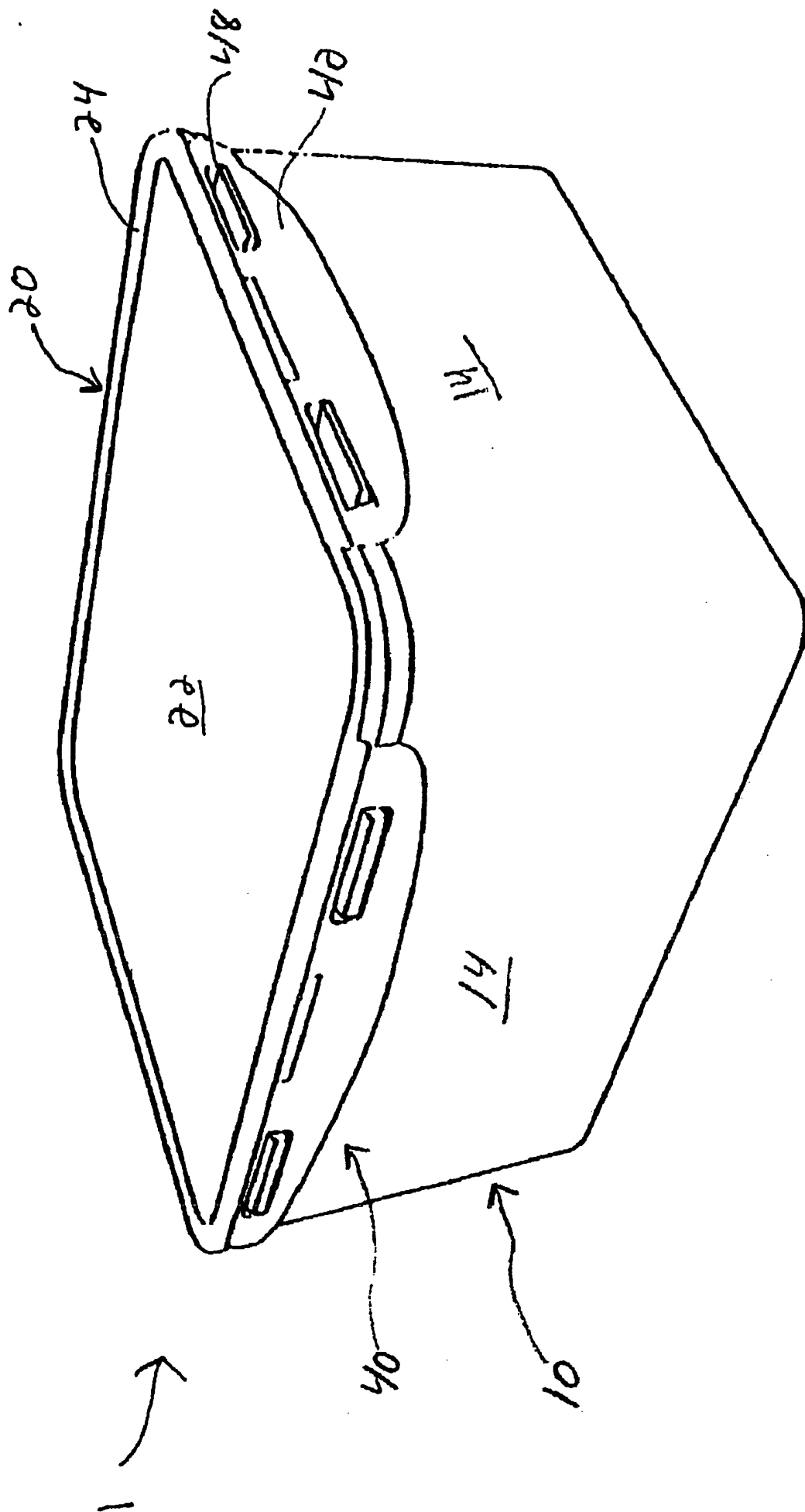


Fig. 4: BOTTOM VIEW OF THE LID



PERSPECTIVE VIEW



REPLACEMENT SHEET



Fig.2

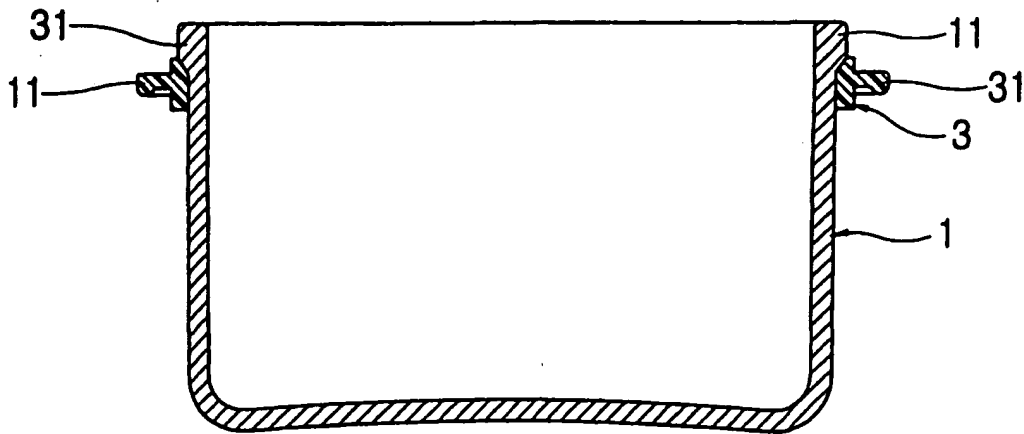
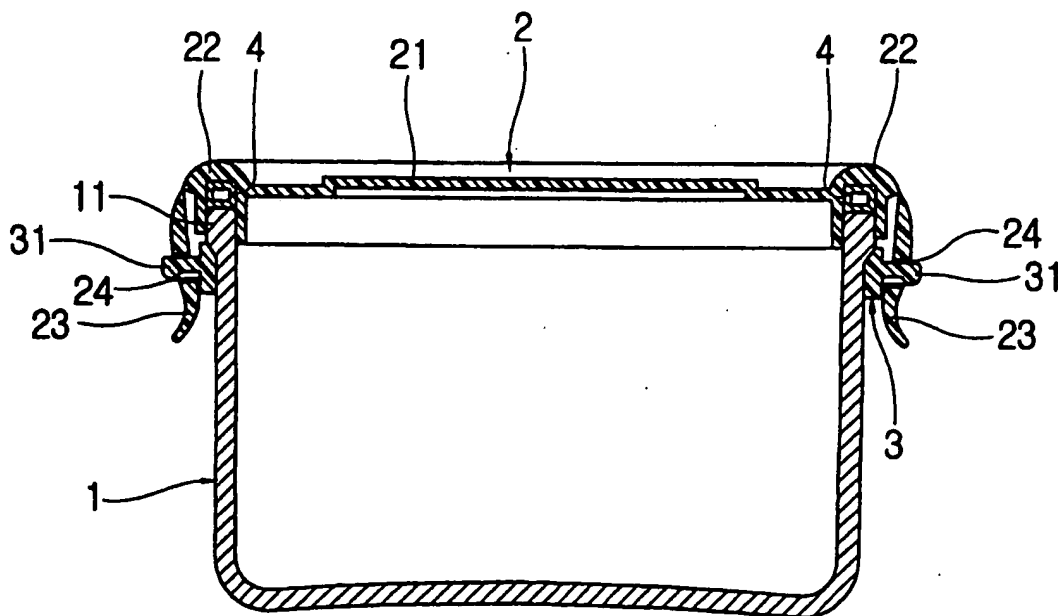


Fig.3



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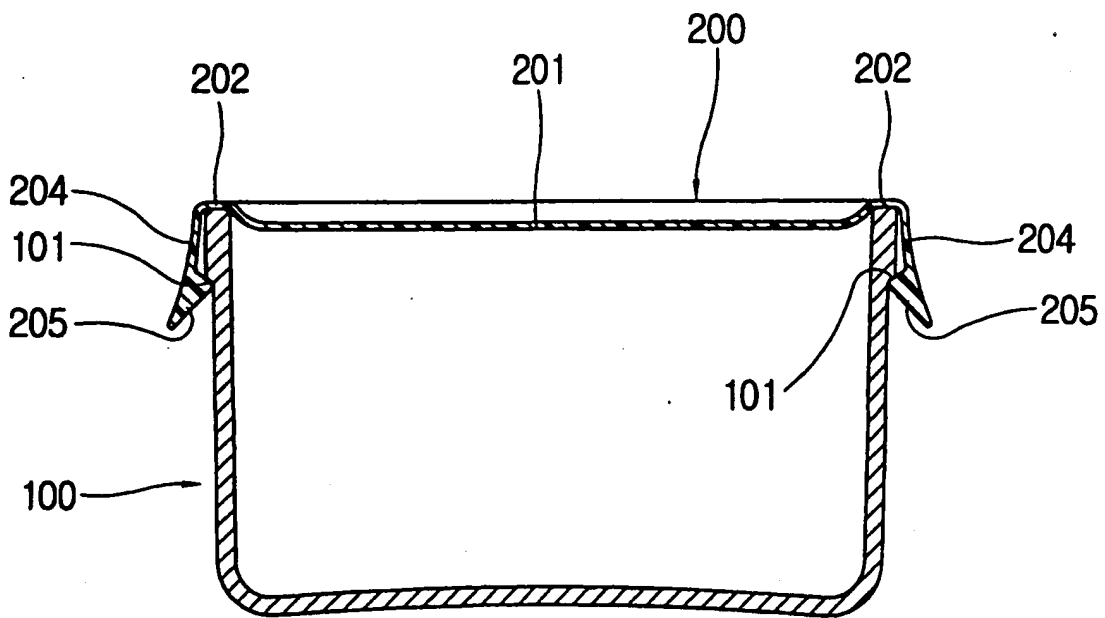
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A cross-sectional view of a container assembly. The container body is labeled 1. The lid is labeled 11. A locking mechanism is shown on the right side of the lid, consisting of a locking pin 31 and a locking sleeve 12. The locking pin 31 is inserted into the lid 11 and extends through the container body 1. The locking sleeve 12 is positioned around the locking pin 31 on the exterior of the container body 1. The locking pin 31 is also labeled 3.

A cross-sectional view of a container assembly. The container body is labeled 1. The lid is labeled 11. The gasket is labeled 3. The gasket is shown in cross-section with a hatched pattern. The gasket is labeled 31 at its ends and 32 along its length. The gasket is shown in cross-section with a hatched pattern.

REPLACEMENT SHEET

Fig.11 (PRIOR ART)



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